

DAFTAR PUSTAKA

- Agbo, E.E.C., Majiwa, P.A.O., Claassen, H. & te Pas, M.F.W. 2002. Molecular variation of *Trypanosoma brucei* subspecies as revealed by AFLP fingerprinting. *Parasitology*, 124(4): 349–358.
- Astuti, D. 2017. Variasi gen mitokondria cytochrome b pada dua jenis burung kakatua putih (*Cacatua alba* dan *C. moluccensis*). *Jurnal Biologi Indonesia*, 7(2): 13–15.
- Awa, D.N. & Ndamkou, C.N. 2006. Response of *Trypanosoma vivax* and *Trypanosoma congolense* in zebu cattle in North Cameroon to prophylactic treatment with two formulations of isometamidium. *Preventive veterinary medicine*, 76(1-2): 90–96.
- Aye, I.L.M.H., Singh, A.T. & Keelan, J.A. 2009. Transport of lipids by ABC proteins: interactions and implications for cellular toxicity, viability and function. *Chemico-biological interactions*, 180(3): 327–339.
- Baker, N., de Koning, H.P., Mäser, P. & Horn, D. 2013. Drug resistance in African trypanosomiasis: the melarsoprol and pentamidine story. *Trends in parasitology*, 29(3): 110–118.
- Boibessot, I., Turner, C.M.R., Watson, D.G., Goldie, E., Connel, G., McIntosh, A., Grant, M.H. & Skellern, G.G. 2002. Metabolism and distribution of phenanthridine trypanocides in *Trypanosoma brucei*. *Acta tropica*, 84(3): 219–228.
- Burri, C., Baltz, T., Giroud, C., Doua, F., Welker, H.A. & Brun, K. 1993. Pharmacokinetic properties of the trypanocidal drug melarsoprol. *Chemotherapy*, 39(4): 225–234.
- Chau, N.V.V., Chau, L.B., Desquesnes, M., Herder, S., Phu, N., Lan, H., Campbell, J.I. & Cuong, N. Van. 2016. MAJOR ARTICLE A Clinical and Epidemiological Investigation of the First Reported Human Infection With the Zoonotic Parasite *Trypanosoma evansi* in Southeast Asia. *Clinical infectious diseases*, 62(8): 1002–1008.
- Chitanga, S., Marcotty, T., Namangala, B., Van den Bossche, P., Van Den Abbeele, J. & Delespaulx, V. 2011. High prevalence of drug resistance in animal trypanosomes without a history of drug exposure. *PLoS neglected tropical diseases*, 5(12): e1454.

- Dargantes, A.P., Campbell, R.S.F., Copeman, D.B. & Reid, S.A. 2005. Experimental *Trypanosoma evansi* infection in the goat. II. Pathology. *Journal of comparative pathology*, 133(4): 267–276.
- Davison, H.C., Thrusfield, M. V, Husein, A., Muharsini, S., Partoutomo, S., Rae, P. & Luckins, A.G. 2000. The occurrence of *Trypanosoma evansi* in buffaloes in Indonesia, estimated using various diagnostic tests. *Epidemiology & Infection*, 124(1): 163–172.
- Degen, R., Pospichal, H., Enyaru, J. & Jenni, L. 1995. Sexual compatibility among *Trypanosoma brucei* isolates from an epidemic area in southeastern Uganda. *Parasitology research*, 81(3): 253–257.
- Delespaux, V., Geerts, S., Brandt, J., Elyn, R. & Eisler, M.C. 2002. Monitoring the correct use of isometamidium by farmers and veterinary assistants in Eastern Province of Zambia using the isometamidium-ELISA. *Veterinary parasitology*, 110(1-2): 117–122.
- Delespaux, V., Geysen, D., Bossche, P. Van Den & Geerts, S. 2008. Molecular tools for the rapid detection of drug resistance in animal trypanosomes. *Trends in Parasitology*, 24(5): 236–242.
- Delespaux, V., Geysen, D., Majiwa, P.A.O. & Geerts, S. 2005. Identification of a genetic marker for isometamidium chloride resistance in *Trypanosoma congolense*. , 35: 235–243.
- Desquesnes, M. 2004. *Livestock trypanosomoses and their vectors in Latin America*. 575th ed. Paris, France: OIE (World Organisation for Animal Health).
- Desquesnes, M., Dargantes, A., Lai, D.-H., Lun, Z.-R., Holzmuller, P. & Jittapalpong, S. 2013. *Trypanosoma evansi* and surra: a review and perspectives on transmission, epidemiology and control, impact, and zoonotic aspects. *BioMed Research International*, 2013.
- Desquesnes, M. & Dávila, A.M.R. 2002. Applications of PCR-based tools for detection and identification of animal trypanosomes: a review and perspectives. *Veterinary Parasitology*, 109: 213–231.
- Desquesnes, M., Holzmuller, P., Lai, D.-H., Dargantes, A., Lun, Z.-R. & Jittapalpong, S. 2013. *Trypanosoma evansi* and surra: a review and perspectives on origin, history, distribution, taxonomy, morphology, hosts, and pathogenic effects. *BioMed Research International*, 2013: 1–22.

- Dt, S., Yuniarto, I., Susiani, H., Amaliah, F. & Santosa, B. 2015. Trypanocidals Effectivity against Some Isolates of *Trypanosoma evansi* Propagated in Mice. , 20(4): 275–284.
- El-Sayed, N.M., Hegde, P., Quackenbush, J., Melville, S.E. & Donelson, J.E. 2000. The African trypanosome genome. *International journal for parasitology*, 30(4): 329–345.
- FAO. 1998. *African animal trypanosomes*. Rome: Food and Agriculture Organization (FAO).79.
- Fulton, J.D. & Grant, P.T. 1955. The preparation of a strain of *Trypanosoma rhodesiense* resistant to stilbamidine and some observations on its nature. *Experimental parasitology*, 4(4): 377–383.
- De Gee, A.L.W., McCann, P.P. & Mansfield, J.M. 1983. Role of antibody in the elimination of trypanosomes after dl- α -difluoromethylornithine chemotherapy. *The Journal of Parasitology*: 818–822.
- Geerts, S. & Holmes, P.H. 1998. Drug management and parasite resistance in bovine trypanosomiasis in Africa. *Drug management and parasite resistance*, 31(1): 1–5.
- Geerts, S., Holmes, P.H., Eisler, M.C. & Diall, O. 2001. African bovine trypanosomiasis: the problem of drug resistance. *Trends in parasitology*, 17(1): 25–28.
- Gott, J.M. & Emeson, R.B. 2000. Functions and mechanisms of RNA editing. *Annual review of genetics*, 34(1): 499–531.
- Handoyo, D. & Rudiretna, A. 2000. Prinsip umum dan pelaksanaan polymerase chain reaction (PCR)[general principles and implementation of polymerase chain reaction]. *Unitas*, 9(1): 17–29.
- Hayes, J.D. & Wolf, C.R. 1990. Molecular mechanisms of drug resistance. *Biochemical Journal*, 272(2): 281.
- Hoare, C.A. 1972. The trypanosomes of mammals. A zoological monograph. *The trypanosomes of mammals. A zoological monograph.*, 17: 794.
- Homeida, A.M., El Amin, E.A., Adam, S.E. & Mahmoud, M.M. 1980. The effect of samorin (isometamedium chloride) on *Trypanosoma evansi* infection in mice. *British journal of experimental pathology*, 61(4): 380.

- Hstreaures. 2018. No Title. *m19 trypanosomes and leishmania*.
<https://hstreaures.com/m19-trypanosomes-and-leishmania-37770/> 13 July 2018.
- Jennings, F.W., Whitelaw, D.D., Holmes, P.H., Chizyuka, H.G.B. & Urquhart, G.M. 1979. The brain as a source of relapsing *Trypanosoma brucei* infection in mice after chemotherapy. *International journal for parasitology*, 9(4): 381–384.
- Joshi, P.P., Shegokar, V.R., Powar, R.M., Herder, S., Katti, R., Salkar, H.R., Dani, V.S., Bhargava, A., Jannin, J. & Truc, P. 2005. Trypanosomiasis Caused By *Trypanosoma evansi* In India : The First Case Report. *The American Journal of Tropical Medicine and Hygiene*, 73(3): 491–495.
- Kajiji, S., Talbot, F., Grizzuti, K., Van Dyke-Phillips, V., Agresti, M., Safa, A.R. & Gros, P. 1993. Functional analysis of P-glycoprotein mutants identifies predicted transmembrane domain 11 as a putative drug binding site. *Biochemistry*, 32(16): 4185–4194.
- Klingbeil, M.M. & Englund, P.T. 2004. Closing the gaps in kinetoplast DNA network replication. *Proceedings of the National Academy of Sciences*, 101(13): 4333–4334.
- Klokouzas, A., Shahi, S., Hladky, S.B., Barrand, M.A. & van Veen, H.W. 2003. ABC transporters and drug resistance in parasitic protozoa. *International journal of antimicrobial agents*, 22(3): 301–317.
- Koh, C.Y. & Kini, R.M. 2009. Molecular diversity of anticoagulants from haematophagous animals. *Thrombosis and haemostasis*, 101(03): 437–453.
- De Koning, H.P., Anderson, L.F., Stewart, M., Burchmore, R.J.S., Wallace, L.J.M. & Barrett, M.P. 2004. The trypanocide diminazene aceturate is accumulated predominantly through the TbAT1 purine transporter: additional insights on diamidine resistance in African trypanosomes. *Antimicrobial Agents and Chemotherapy*, 48(5): 1515–1519.
- Leach, T.M. & Roberts, C.J. 1981. Present status of chemotherapy and chemoprophylaxis of animal trypanosomiasis in the eastern hemisphere. *Pharmacology & therapeutics*, 13(1): 91–147.
- Levine, N.D. 1985. *Veterinary protozoology*. Iowa State University Press Ames.
- Losos, G.J. 1986. *Infectious tropical diseases of domestic animals*. Longman Scientific & Technical.

- Lun, Z.-R., Li, A.-X., Chen, X.-G., Lu, L.-X. & Zhu, X.-Q. 2004. Molecular profiles of *Trypanosoma brucei*, *T. evansi* and *T. equiperdum* stocks revealed by the random amplified polymorphic DNA method. *Parasitology Research*, 92(4): 335–340.
- Macaraeg, B.B., Lazaro, J. V, Abes, N.S. & Mingala, C.N. 2013. In-vivo assessment of the effects of trypanocidal drugs against *Trypanosoma evansi* isolates from Philippine water buffaloe (*Bubalus bubalis*). *Veterinarski arhiv*, 83(4): 381–392.
- Manuel, M.F. 1998. Sporadic outbreaks of surra in the Philippines and its economic impact. *Journal of Protozoology Research*, 8(3): 131–138.
- Marquis, N., Gourbal, B., Rosen, B.P., Mukhopadhyay, R. & Ouellette, M. 2005. Modulation in aquaglyceroporin AQP1 gene transcript levels in drug-resistant *Leishmania*. *Molecular microbiology*, 57(6): 1690–1699.
- Matovu, E., Seebeck, T., Enyaru, J.C.K. & Kaminsky, R. 2001. Drug resistance in *Trypanosoma brucei* spp., the causative agents of sleeping sickness in man and nagana in cattle. : 763–770.
- Matovu, E., Stewart, M.L., Geiser, F., Brun, R., Mäser, P., Wallace, L.J.M., Burchmore, R.J., Enyaru, J.C.K., Barrett, M.P. & Kaminsky, R. 2003. Mechanisms of arsenical and diamidine uptake and resistance in *Trypanosoma brucei*. *Eukaryotic Cell*, 2(5): 1003–1008.
- McDermott, J., Woitag, T., Sidibé, I., Bauer, B., Diarra, B., Ouédraogo, D., Kamuanga, M., Peregrine, A., Eisler, M. & Zessin, K.-H. 2003. Field studies of drug-resistant cattle trypanosomes in Kenedougou Province, Burkina Faso. *Acta Tropica*, 86(1): 93–103.
- McPherson, M. & Møller, S. 2007. *Polimerase Chain Reaction (PCR)*. Taylor & Francis.
- Men, A.E., Wilson, P., Siemering, K. & Forrest, S. 2008. Sanger DNA sequencing. *Next-Generation Genome Sequencing: Towards Personalized Medicine*: 1–11.
- De Menezes, V.T., Queiroz, A.O., Gomes, M.A.M., Marques, M.A.P. & Jansen, A.M. 2004. *Trypanosoma evansi* in inbred and Swiss-Webster mice: distinct aspects of pathogenesis. *Parasitology Research*, 94(3): 193–200.
- Morrison, W.I., Murray, M., Sayer, P.D. & Preston, J.M. 1981. The pathogenesis of experimentally induced *Trypanosoma brucei* infection in the dog. I. Tissue and organ damage. *The American journal of pathology*, 102(2): 168.

- Mulugeta, W., Wilkes, J., Mulatu, W., Majiwa, P.A.O., Masake, R. & Peregrine, A.S. 1997. Long-term occurrence of *Trypanosoma congolense* resistant to diminazene, isometamidium and homidium in cattle at Ghibe, Ethiopia. *Acta tropica*, 64(3-4): 205–217.
- Na'Isa, B.K. 1967. Follow-up of a survey on the prevalence of homidium-resistant strains of trypanosomes in cattle in Northern Nigeria and drug cross-resistance tests on the strains with Samorin and Berenil. *Bulletin of epizootic diseases of Africa*, 15(3): 231–241.
- Nantulya, V.M. 1994. Suratex: a simple latex agglutination antigen test for diagnosis of *Trypanosoma evansi* infections (surra). *Tropical medicine and parasitology: official organ of Deutsche Tropenmedizinische Gesellschaft and of Deutsche Gesellschaft fur Technische Zusammenarbeit (GTZ)*, 45(1): 9–12.
- NCBI. 2018. No Title. *PubChem Compound Database*. <https://pubchem.ncbi.nlm.nih.gov/compound/Isometamidium#section=Chemical-and-Physical-Properties>. 13 July 2018.
- Nelson, D.L. & Cox, M.M. 2005. *Lehninger Principles of biochemistry*. , 3: 1–42.
- Njiru, Z.K., Constantine, C.C., Guya, S., Crowther, J., Kiragu, J.M., Thompson, R.C.A. & Dávila, A.M.R. 2005. The use of ITS1 rDNA PCR in detecting pathogenic African trypanosomes. *Parasitology Research*, 95(3): 186–192.
- Njiru, Z.K., Constantine, C.C., Ndung'u, J.M., Robertson, I., Okaye, S., Thompson, R.C.A. & Reid, S.A. 2004. Detection of *Trypanosoma evansi* in camels using PCR and CATT/T. *evansi* tests in Kenya. *Veterinary parasitology*, 124(3-4): 187–199.
- Nurchahyo, R.W. 2013. Occurrence Trypanosomiasis in Indonesia. In *Workshop on Biting flies and Trypanosome*. Ipoh, Malaysia: 1–35.
- Nurchahyo, R.W. 2017. *Penyakit Surra Pada Hewan dan Ternak*. 1st ed. J. Prastowo, ed. Yogyakarta: Samudra Biru Press.
- Nurchahyo, R.W. 2014. *Trypanosomiasis pada Ternak di Indonesia*. Jakarta.
- Nurchahyo, W., Priowidodo, D. & Prastowo, J. 2017. *Trypanosoma evansi* Detection and Vector Identification in Central Java and Yogyakarta, Indonesia. In *Proceeding of the 1st International Conference on Tropical Agriculture*. Springer: 549–559.
- Nuryady, M.M., Utomo, S. setyo, Armiyanti, Y., Mumpuni, S.R.I., Widjajati, W. & Senjarini, K. 2017. Analysis of Human Immune Response against Salivary

Glands Protein Extract of *Anopheles sundaicus* . L in Malaria Endemic Area. *Microbiology Indonesia*, 11(1): 29–33.

OIE. 2018. Manual of Diagnostic Tests and Vaccines for Terrestrial Animals 2018. In Paris: World Organisation for Animal Health: 1–4.

Payne, R.C., Sukanto, I.P., Djauhari, D., Partoutomo, S., Wilson, A.J., Jones, T.W., Boid, R. & Luckins, A.G. 1991. *Trypanosoma evansi* infection in cattle, buffaloes and horses in Indonesia. *Veterinary Parasitology*, 38(2-3): 109–119.

Peregrine, A.S., Gray, M.A. & Moloo, S.K. 1997. Cross-resistance associated with development of resistance to isometamidium in a clone of *Trypanosoma congolense*. *Antimicrobial agents and chemotherapy*, 41(7): 1604–1606.

Prayoga, W. & Agustin, K.W. 2015. Polymerase Chain Reaction untuk deteksi *Salmonella* sp. *Jurnal Pangan dan Agroindustri*, 3(2): 438–488.

Ressang, A.A. 1984. Patologi Khusus Veteriner, Ed ke-2. *Bali: Percetakan Bali*, 2: 1–240.

Rubio, J.P. & Cowman, A.F. 1994. *Plasmodium falciparum*: the *pfmdr2* protein is not overexpressed in chloroquine-resistant isolates of the malaria parasite. *Experimental parasitology*, 79(2): 137–147.

Sambrook, J., R.D.. 2001. *Molecular Cloning: A Laboratory Manual*. 3th editio. New York: Cold Spring Harbor Laboratory press.

Sauvage, V., Aubert, D., Escotte-Binet, S. & Villena, I. 2009. The role of ATP-binding cassette (ABC) proteins in protozoan parasites. *Molecular and biochemical parasitology*, 167(2): 81–94.

Schillinger, D., Maloo, S.H. & Röttcher, D. 1985. The toxic effect of intravenous application of the trypanocide isometamidium (Samorin®). *Zentralblatt für Veterinärmedizin Reihe A*, 32(1-10): 234–239.

Schneider, E. & Hunke, S. 1998. ATP-binding-cassette (ABC) transport systems: functional and structural aspects of the ATP-hydrolyzing subunits/domains. *FEMS microbiology reviews*, 22(1): 1–20.

Schnitzer, R.J. & Grunberg, E. 1957. Drug Resistance of Microorganisms. *Drug Resistance of Microorganisms.*, 14: 395–405.

Shahi, S.K., Krauth-Siegel, R.L. & Clayton, C.E. 2002. Overexpression of the putative thiol conjugate transporter TbMRPA causes melarsoprol resistance in *Trypanosoma brucei*. *Molecular microbiology*, 43(5): 1129–1138.

- Shapiro, T.A. & Englund, P.T. 1990. Selective cleavage of kinetoplast DNA minicircles promoted by antitrypanosomal drugs. *Proceedings of the National Academy of Sciences*, 87(3): 950–954.
- Sinyangwe, L., Delespaux, V., Brandt, J., Geerts, S., Mubanga, J., Machila, N., Holmes, P.H. & Eisler, M.C. 2004. Trypanocidal drug resistance in eastern province of Zambia. *Veterinary parasitology*, 119(2-3): 125–135.
- Souza, W. de. 1999. A short review on the morphology of *Trypanosoma cruzi*: from 1909 to 1999. *Memórias do Instituto Oswaldo Cruz*, 94: 17–36.
- Souza, W. de. 2008. Electron microscopy of trypanosomes: a historical view. *Memórias do Instituto Oswaldo Cruz*, 103(4): 313–325.
- Soviana, S. 1988. *Lalat Tabanidae dan Peranannya dalam Epidemiologi Penyakit Surra*. Bogor: IPB (Bogor Agricultural University).
- Stevens, J.R. & Brisse, S. 2004. Systematics of trypanosomes of medical and veterinary importance. *The trypanosomiases*: 1–23.
- Subekti, D.T. 2014. Perkembangan, struktur, mekanisme kerja dan efikasi trypanosidal untuk Surra. *Wartazoa*, 24: 1–15.
- Sutherland, I.A. & Holmes, P.H. 1993. Alterations in drug transport in resistant *Trypanosoma congolense*. *Acta tropica*, 54(3-4): 271–278.
- Valdés, J., Taylor, M.C., Cross, M.A., Ligtenberg, M.J.L., Rudenko, G. & Borst, P. 1996. The viral thymidine kinase gene as a tool for the study of mutagenesis in *Trypanosoma brucei*. *Nucleic acids research*, 24(10): 1809–1815.
- Wardhana, A. & Dt, S. 2013. Aktivitas Antitrypanosoma Ekstrak Air Daun *Tithonia diversifolia* A . Gray dan *Artemisia annua* L . Terhadap *Trypanosoma evansi* Secara In Vitro (In Vitro Antitrypanosomal Activity of Aqueous Extract of *Tithonia diversifolia* and *Artemisia annua* leaves Agai. : 393–400.
- Wardhana, A.H., Merlina, Y. & Subekti, D.T. 2014. Aktivitas Antitrypanosoma Ekstrak Air Daun *Tithonia diversifolia* A. Gray dan *Artemisia annua* L. terhadap *Trypanosoma evansi* secara in vitro. *JITV*, 19(2): 14–21.
- Witola, W.H., Inoue, N., Ohashi, K. & Onuma, M. 2004. RNA-interference silencing of the adenosine transporter-1 gene in *Trypanosoma evansi* confers resistance to diminazene aceturate. , 107: 47–57.



**UJI SENSITIVITAS Trypanosoma evansi DENGAN PEMBERIAN OBAT ISOMETAMIDIUM KLORIDA
SECARA IN VIVO PADA
MENCIT (*Mus musculus*) DAN DETEKSI MOLEKULER GEN PENYANDI KELUARGA PROTEIN ATP
BINDING CASSETTE (ABC)
TRANSPORTER**

MOH. MIRZA NURYADY, Dr. drh. Rini Widayanti

Universitas Gadjah Mada, 2019 | Diunduh dari <http://etd.repository.ugm.ac.id/>

Yuwono, T. 2006. Teori dan Aplikasi Polymerase Chain Reaction; panduan eksperimen PCR untuk memecahkan masalah biologi terkini. *Yogyakarta: Penerbit Andi*: 89.

Zalis, M.G., Wilson, C.M., Zhang, Y. & Wirth, D.F. 1993. Characterization of the pfmdr 2 gene for Plasmodium falciparum. *Molecular and biochemical parasitology*, 62(1): 83–92.